FCC 96-155

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
	)	
The Development of Operational,	)	WT Docket No. 96-86
Technical, and Spectrum	)	
Requirements for Meeting	)	
Federal, State and Local Public	)	
Safety Agency Communication	)	
Requirements Through the	)	
Year 2010	)	

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1. INTRODUCTION

A brief examination of the after-effects of tragedies such as the World Trade Center and Oklahoma City bombings, or relief efforts following disasters such as Hurricanes Hugo and Andrew, demonstrate that the interoperability issues of public safety communications are real and ongoing. While major events such as these capture the most attention, the need for communication interoperability is even greater during routine day-to-day operations. Police communicating with fire and rescue units at the scene of a traffic accident, the county sheriff communicating with the city police, or a multi-agency criminal task force are just a few examples where communications interoperability plays a vital role in providing service to the citizen.

The Public Safety Wireless Network evolved from a National Performance Review Information Technology Initiative (IT-04) and a subsequent Memorandum of Understanding between the Department of the Treasury and the Department of Justice to address the wireless communications interoperability problems of the public safety community at the Federal, state and local levels. The Federal Law Enforcement Wireless Users Group (FLEWUG), a joint activity of the Department of the Treasury and Department of Justice, was tasked with organizing and coordinating the development of the initiative. The result of this initiative will be an implementation plan for a nationwide Public Safety Wireless Network (PSWN) for use by Federal, state and local law enforcement and public safety agencies. The PSWN Initiative represents the first time that agencies have been commissioned to resolve the long-standing issues of communication interoperability and tactical radio coverage. The initiative serves to address the issues of interoperability, spectrum needs and efficiencies, and shared infrastructure and systems concepts.

On June 30, 1995, the FLEWUG published, "The Public Safety Wireless Network of the Future - Management Plan". The plan set broad objectives for the PSWN and recognized the importance of including state and local public safety agencies in the planning process through the establishment of a joint Program Management Office (PMO). The organization and management approach discussed in the PSWN Program Management Plan is based on the premise of learning from the experiences of others; encouraging innovation in meeting changing needs and requirements; and including all "stakeholders", i.e., Federal, state and local public safety agencies, industry and academia in the process.

The national focus of this program requires a flexible organizational structure with a mechanism that allows for outside advice and guidance to the joint Program Management Office. Program relationships are shown in figure one, and explained in the following paragraphs.

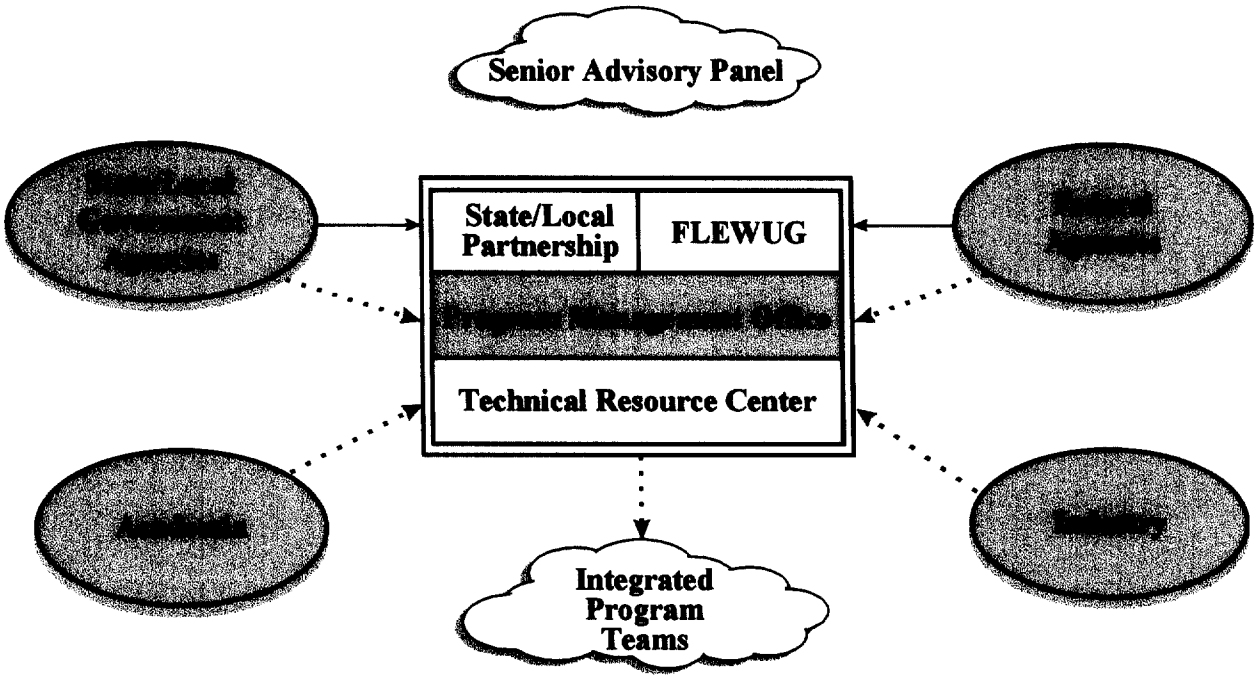

Figure 1

- The joint Program Management Office is chartered to organize, direct, manage and coordinate the day-to-day activities of the program. The Federal Government provides funding and a limited number of qualified full-time employees as the core program management team. State and local governments are encouraged to participate by assigning a representative from their agencies to work with the program management team.

- The Senior Advisory Panel is being developed to consist of senior level officials from Federal, state and local government agencies, and senior leaders from industry and academia. The Senior Advisory Panel provides leadership and oversight, interagency coordination, a bridge between Federal, state and local governments, an effective conduit for the articulation of issues and requirements between policy makers and the public safety community, and a timely, proactive builder of recommendations for legislative change.

- The Technical Resource Center (TRC) plays a significant role in program execution. The TRC is a central repository. and clearinghouse for information related to the program, its activities, schedules, and accomplishments. The Technical Resource Center supports research and development, studies, simulation and modeling, and provides support for technical forums and seminars.

- The Integrated Program Team concept pulls together the necessary resources to allow the program to focus on, and achieve specific objectives. It provides a forum wherein stakeholders at all levels work together to achieve the common goals. The Integrated Program Team consists of: Federal representatives, state and local representatives on assignment, contractor technical and administrative support staff, and subject matter experts.

As a national level program, the Program Management Office functions as a virtual agency with reporting requirements to the Government Information Technology Services Board (GITS). The GITS is a government Board established by Executive Order 13011 to facilitate and coordinate government-wide information technology initiatives. A member of the GITS Board is assigned as a "Champion" to oversee the program.

Spectrum management is a critical component in achieving the goal of the nationwide wireless network for use by Federal, state and local public safety agencies. However the current spectrum management structure is divided between the National Telecommunications and Information Administration (NTIA)[1] and the FCC.

Although public safety is a very important part of the FCC's responsibilities, it represents a small portion of their overall mission. The NTIA, on the other hand, is chartered mainly to provide spectrum management for the Federal Government.

Before sharing and joint-use systems become more common, and before the national network can become a reality, joint spectrum management and frequency coordination issues must be resolved. Combining Federal, state and local public safety spectrum management within the NTIA is an option that should provide for more effective national planning and coordination, improved interoperability, spectral efficiency, and agent officer safety.

Under this concept we do not foresee any change in state and local coordination through the current frequency coordinators.

The comments contained in this document are based on two specific recommendations:

1) *The FLEWUG recommends that the PSWN PMO take the lead in implementing the Public Safety Wireless Advisory Committee (PSWAC) recommendations.*

2) *The FLEWUG recommends an independent study be commissioned to evaluate the benefits of consolidating all public safety frequency management under the NTIA.*

[1] The Communications Act of 1934 gave the President of the United States authority to use frequencies as determined to be in the national interest and to assign those frequencies accordingly. In 1977, the President's authority for telecommunications was transferred to the Secretary of Commerce by Reorganization Plan No. 1 of 1977 and Executive Order 12046 of March 26, 1978. The Secretary of Commerce was then directed to assign communications and information functions to the Assistant Secretary of Commerce and the NTIA, according to a revision of the NTIA Organization Act. Once established, the NTIA established a participatory structure with representatives from Federal agencies, the FCC, industry and private sector users. This structure was established to improve the effectiveness of the spectrum coordination and assignment process. As a result, the Assistant Secretary of Commerce assumed a role as Administrator of the NTIA.

2. EXECUTIVE SUMMARY

The Public Safety Wireless Advisory Committee (PSWAC) was an effective forum that encouraged public safety representatives to openly discuss issues, give their opinions, and create a sense of ownership in developing possible solutions for the many spectrum issues facing the public safety community. While the PSWAC provided specific recommendations concerning the amount of spectrum needed by the community it left open a number of issues that require further study and analysis. The PSWN PMO is in place to bring together all stakeholders to address these issues. The FLEWUG recommends using the PSWN PMO resources to:

- Serve as the focal point for the development of a common operating environment for intersystem and over-the-air standards for interoperability
- Study the effectiveness of current procedures with regard to their impact on network sharing
- Serve as a forum for identifying and evaluating incentives that encourage agencies to participate in shared systems
- Develop national guidelines for regional planning authorities
- Facilitate ongoing discussions to identify future user requirements
- Undertake studies to determine the appropriate size of spectrum "blocks" that support public safety user needs for voice, video, data; competing access technologies, and assures efficient use of the spectrum
- Evaluate why some shared systems work better than others
- Formalize an ongoing commercial vendor outreach program
- Conduct other studies and analyses as appropriate or as needed
- Utilize test beds or prototype systems for proof-of-concept

3. BACKGROUND

Section 17 of the NPRM asks for comments regarding the implementation of block allocations.

The FLEWUG supports the PSWAC Steering Committee recommendations regarding block allocations as outlined in the PSWAC Final Report.[2]

The block allocation system dedicates a band of contiguous frequencies to one or more radio services depending on the technical and operational characteristics of the service(s). The block allocation system in the United States apportions spectrum for exclusive use by the Federal Government, exclusive use by the non-Federal Government, and for shared use among Federal and non-Federal users. Further, within a block the services may have a hierarchical structure (i.e., Primary, Permitted, or Secondary) that grants rights or imposes limitations on the services relative to other services in the same block. There is, however considerable flexibility in the block allocation system. Footnotes to the allocation blocks may permit operation of additional radio services in the spectrum block, restrict the operation of services allocated in the block, specify or clarify the relative status of services in a block, or stipulate other requirements for operation. Other footnotes may permit multi-mode operation, where the transmitted signal is used for more than one purpose, and would otherwise be separate radio services.

- Block allocations should be of sufficient size to support the deployment of any of the competing over the air access technologies. We note that the recent PCS allocations supporting competing technologies were allocated spectrum block sizes from 10 to 30 MHz. The FLEWUG recommends that the PSWN PMO undertake studies to determine the appropriate size of spectrum "blocks" that support public safety user needs for voice, video, data; competing access technologies, and assures efficient use of the spectrum.

[2] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Section 2.2.3.

4. DISCUSSION

4.1 Interoperability Issues

4.1.1 Definitions

The NPRM asks for comments regarding the adoption of the definitions of "public safety" and "interoperability", in sections 24 and 27 respectively.

The FLEWUG supports the adoption of the PSWAC definition of public safety[3], where all government, including Federal, is considered public safety. Additionally, the FLEWUG supports the adoption of the PSWAC definition of interoperability.[4]

4.1.2 Interoperability Needs

The FLEWUG concurs with the public safety interoperability requirements outlined in the PSWAC Report[5].

Where the NPRM asks for comment on whether there are other contexts in public safety communications in which interoperability is needed (refer to sections 30 & 31), FLEWUG members believe it is important to raise the visibility of the interoperability needs for non-public safety entities such as utilities and other emergency response organizations which may be required to support public safety agencies and visa versà. Currently, many non-public safety agencies like utility companies operate on systems designed to support administrative functions rather than public safety response. Many systems operated by other emergency service agencies were built before interoperability was recognized as an issue, and did not make provision for interaction with public safety agencies. Now that the limitations associated with lack of interoperability have become nationally recognized through the PSWAC process and other efforts, non-public safety and other emergency service agencies can be encouraged to build systems with options for interoperability with public safety agencies. Future public safety and non-public safety systems can be planned with the flexibility to interoperate via gateways, through participation on a shared system, or through the use of a common interoperability band. Provisions for policies or regulations to implement a plan for non-public safety organizations and emergency services interoperability with public safety agencies needs to be carefully planned among all of the organizations involved, in order ensure consistency.

The US Coast Guard currently has plans to replace its VHF radio National Distress System; if planned properly, there is a chance that the agency could extend the range of its system to cover public safety radio bands. As the US Coast Guard plans it new network, the FLEWUG

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[3] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Section 4.3.2.

[4] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Section 4.3.2.

[5] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Sections 2.1.5, 4.3.3, 4.3.4, 4.3.5.

recommends that the FCC, the NTIA, the US Coast Guard, and public safety agencies closely coordinate efforts to apply what we have learned through the PSWAC process and other efforts.

4.1.3 Support for Shared Systems

The FLEWUG believes that development of shared systems is one of the better solutions in attaining interoperability among local and concurrent jurisdictions. Shared systems planning and implementation require new approaches to licensing, funding, and management support, compared to the mechanisms in place for separate systems.

4.1.3.1 Policy, Regulation, and Administration

The feasibility and effectiveness of several state and regional initiatives are discussed in section 32, and the FCC requests comment on those initiatives.

State and local agencies seeking to establish interoperable systems on the scale of the San Diego/Imperial County, California, Colorado, Nevada and South Carolina initiatives are increasingly encountering complex policies, regulations, and processes in their efforts to secure the frequency authorizations needed for full multi-jurisdictional and multi-discipline support. The FLEWUG proposes that the PSWN Program Management Office evaluate what changes need to be made to policies, regulations, and processes that could help rectify impediments to future shared initiatives. In addition, the PSWN Program Management Office should evaluate the effectiveness of unique administrative approaches (e.g., the Memorandum of Understanding (MOU) being drafted between Wisconsin and the Department of Defense for shared use of spectrum).

4.1.3.2 Infrastructure

Section 38 of the NPRM asks responders to comment on infrastructure-related solutions to interoperability.

FLEWUG supports cross band repeaters and network gateways in applications where more desirable methods of interoperability are not available. For instance, cross band repeaters and network gateways can provide a viable solution to interoperability with non-public safety entities such as utilities called in to assist during an emergency. For non-mission critical, day-to-day operations, the FLEWUG believes the development of interfaces and gateways between public safety agencies and commercial infrastructures should be encouraged.

4.1.3.3 Costs

While the FLEWUG has no specific comments to the NPRM request in section 38 for feedback on estimated costs, it should be recognized there are significant monetary, administrative, resource, upgrade, and replacement costs associated with acquiring new frequencies and establishing systems.

Agencies cannot give up their significant investments in networks having large, embedded equipment bases and infrastructures. The migration to shared systems will likely occur as existing networks approach the end of their life cycles. In the meantime, agencies may face an interim cost associated with the purchase of dual-band radios designed to interoperate with other local agencies, as well as the investment to access a single, nation-wide mutual aid band.

Incentives that could encourage agencies to move away from, rather than upgrade their existing networks include the long-term savings they may realize from the economies-of-scale that a shared network may offer. The PSWN PMO should evaluate whether additional incentives should be provided to agencies to encourage them to actively participate in shared systems.

Unless significant changes are made in licensing procedures, costs associated with those procedures will go up as system sharing increases. In the absence of policies, regulations, and procedures to accommodate new issues associated with shared systems, there is a growing need to hire additional consultants, frequency coordinators, attorneys, or administrators who can urge existing regulatory bodies to develop more flexibility. This may appear to impact state and local public safety agencies more strongly than Federal agencies due to their diverse licensing procedures, but these costs are inherent for federal agencies, as well. Federal agencies hire outside consultants to handle frequency coordination and assignments on their behalf. They utilize in-house legal counsel, which would appear to save on legal fees, however those resources still have associated costs. In order to fund the impending costs associated with the administration of shared systems, we recommend that a public safety escrow account be established, and that all or part of this escrow be funded by future spectrum auction revenues. Costs could be partially eased if the policy and regulatory guidelines were streamlined. To that effect, the FLEWUG recommends that the NTIA administer allocations and assignments, and handle all policy and regulatory issues associated with public safety frequency administration at the Federal, state and local levels.

4.1.3.4 Spectrum

Section 38 of the NPRM requests a discussion of the options to achieve interoperable communications with regard to spectrum.

Interoperability between public safety users in the past has been hampered by an interdependent set of factors that includes:

1. Widely dispersed and fragmented spectrum allocations that can not be covered by multi-band radios

2. Nonstandard frequency spacing and system access methods

4.2 Lack of clear, nationwide channels allocated solely for interoperability[6]

The FLEWUG offers the following discussion, which includes recommendations that may contribute to a better environment for enabling wireless interoperability.

4.2.1.1.1 Day to Day Operations Support

Bands currently used by public safety for day-to-day operations should be restructured and consolidated. However the reallocation of public safety users to a *single* new band for day-to-day operations is not feasible because of the need to maintain spectrum that has different propagation characteristics for the wide variety of operating environments and geography that applies to public safety.

The FLEWUG believes that moving all public safety agencies to a *fewer number* of contiguous bands enables easier development of more shared systems based on multi-band radios. The FLEWUG recommends moving public safety to fewer contiguous bands in a manner that offers an equivalent amount of spectrum to that which is currently available to public safety, and which offers room for growth in the future (e.g. near flexible adjacent bands).

The FLEWUG recommends the PSWN PMO work with policy making bodies to coordinate the best method to restructure and consolidate bands, and to establish a time frame, along with a reasonable plan for migration.

4.2.1.1.2 Universal Mutual Aid Channels

Section 39 asks responders to comment on the establishment of new mutual aid channels, while continuing to operate existing communications equipment. The FLEWUG emphasizes its strong support for the PSWAC concept of creating a single common frequency band dedicated exclusively to public safety interoperation applications.[7]

The concept of a distinct mutual band for special operations does not preclude the need for additional spectrum within adjacent or existing bands to support shared systems for day-to-day interoperability needs.

Questions and requests for comment in section 40 addressed a number of spectrum-related topics, as outlined below.

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[6] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Section 2.1.4.

[7] "Interoperability Subcommittee Report" (Washington, DC: Public safety Wireless Advisory Committee, July 29, 1996), p.5, Section 1.5.4

4.2.1.1.3 Spectrum Quantity

The FLEWUG supports the PSWAC recommendations regarding the amount of additional spectrum required from today to the year 2010.[8]

In response to questions posed in section 40, the FLEWUG believes that twenty channels are inadequate to satisfy the interoperability needs of public safety. The FLEWUG supports the PSWAC Interoperability Subcommittee recommendation for 21 paired voice links and 20 simplex voice links within the existing bands.[9] Additionally, 31 repeater voice, 70 simplex voice, two independent high speed data links and two independent full motion video links must be provided in the new public safety spectrum.

4.2.1.1.4 Optimum Candidates for Near-Term Interoperability

In response to the question in section 40 regarding optimum channels, the FLEWUG believes the recommendation for immediate shared use of the 174 - 216 MHz VHF TV band by public safety for near-term interoperability.[10] Channel 7 is adjacent to existing Federal, state and local public safety spectrum allocations. Therefore, many agencies would not have to invest significant amounts of money in new radio equipment.

4.2.1.1.5 Priorities

Section 40 additionally poses questions regarding priority access. The PSWN PMO should help develop national guidelines for regional planning authorities to establish access priorities.

4.2.1.2 Common Modes

The following responses are intended to address questions and requests for comment in sections 41 and 42 of the NPRM.

Although the PSWAC Final Report supports a common mode of operation for interoperability, there was no recommendation for a mandatory migration within the public safety community. Although the Federal Government has a mandate to move to 12.5 kHz channel bandwidth by a date certain (2005 for VHF and 2008 for UHF), there is no mechanism currently in place or recommended for future implementation that ensures that change will occur within the non-Federal community.

If change is not forced, agencies will continue to operate older equipment that is neither spectrum efficient nor easily interoperable. Any new equipment manufactured for the public safety community, no matter how technically advanced and spectrum efficient, will have to be "dual

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[8] "Public Safety Wireless Advisory Committee Final Report, Volume 2", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), p. 3.

[9] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Section 4.3.27.3.

[10] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Section 2.2.2.2.

mode" at minimum to support the older technology.

As common bands are selected to enhance communications interoperability, it is important that common modes of operation are also implemented to ensure effectiveness. As with the FCC's Refarming Rules, there is no mandate that public safety users change out their systems. However, at some point users will be forced to upgrade their systems when equipment can no longer be repaired or replaced with the older technology.

The PSWN PMO can develop a plan that will encourage the user community, possibly through mandates and/or funding incentives, to move to more spectrally efficient and technologically advanced equipment that will also increase their interoperability capabilities. The PSWN PMO should serve as the focal point for the development of a common operating environment for intersystem and over-the-air standards for interoperability.

The FLEWUG recognizes that there are a number of existing standards that have been identified by many organizations which may be applicable to this effort.

4.3 Operational Issues

In response to the request for comment in section 46 regarding the types of services that public safety agencies will need to accomplish their missions, the FLEWUG supports operational requirements as reflected in the "PSWAC, Operational Requirements Subcommittee Report", which outlines the types of services that public safety agencies will need to accomplish their missions.[11]

In addition, the FLEWUG supports the conclusions reached by the PSWAC Spectrum Subcommittee regarding the need for additional spectrum and the manner in which that need may be satisfied.[12]

4.3.1 Service Features

Where section 49 seeks comment on what additional service features are anticipated for public safety needs, the FLEWUG focuses on two near-term services.

One is wireless data support of the NCIC 2000. The FLEWUG agrees with the PSWAC on their conclusion that "The implementation of the FBI's National Crime Information Center - Project 2000 (NCIC-2000) program will have a significant impact on public safety radio systems - both in the near term and in the future."[13] Other database integration projects are likely to follow.

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[11] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Sections 4.1 - 4.1.22.

[12] "Public Safety Wireless Advisory Committee Final Report, Volume 2", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), pp. 54 - 61.

[13] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Section 2.1.23.

Another service receiving widespread attention is encryption. Encryption options for all law enforcement agencies are becoming widely discussed, and the FLEWUG believes that encryption will be implemented ahead of many other service features.

In response to questions in section 49 about additional capacity needed to support new services, the FLEWUG refers to the following PSWAC report statement:

> Federal government users indicated that future Federal requirements could be satisfied in the currently allocated Federal bands providing that: (1) no more Federal allocations are lost through transfer to the FCC for commercial use; (2) the assumed spectrum-efficient technologies become available as needed; (3) funds are provided by appropriations to implement the spectrum-efficient technologies into Federal radio systems.[14]

The FLEWUG notes that the PSWAC took into account the potential impact of newer, spectrally efficient technologies when identifying spectrum requirements for their final report;[15] the FLEWUG supports that assessment.

4.3.2 System Requirements

In reference to the FCC's question in section 51 about what specifications for equipment should be included in FCC rules, the FLEWUG recommends that the PSWN PMO identify initial critical public safety requirements. The FLEWUG specifically disagrees that public safety equipment requirements should be identified by the FCC at this time.

The FCC requests for comments on a requirement for licensees to utilize joint networks for public safety communications, as outlined in section 55, are addressed by the FLEWUG below, in terms of priority access.

Although the Final Report of the PSWAC states that, "The Steering Committee agrees with a flexible regulatory environment which encourages the development of shared system infrastructure supporting public safety communications", issues like priority access, uncontrolled cost increases, and uncoordinated system modifications are not fully addressed.

The ideal shared system should allow high priority users to share the network with low priority users. If high priority users are able to pre-empt low priority users during times of increased high-priority demand, a "virtual reserve capacity" becomes available to high priority users for emergency situations. This concept is realized today where a trunked land mobile system is shared among law enforcement, fire, EMS, and local government users, with priority authorization granted to certain user groups. Trunked land mobile radio systems could also be shared between public safety and non-public safety entities.

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[14] Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Section 4.4.9.

[15] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Section 4.4.10.

In those instances, high priority applications would be public safety operations, including Federal Government users; examples of low priority users may be routine maintenance and administrative radio applications. Ownership of the system would reside with the high priority user. System capacity not needed for emergency operations could be leased at below commercial rates, with the caveat that access to the system by low-priority users could not be guaranteed during emergencies. This would both subsidize the construction of the system and assure that the system operates at near full capacity all the time.

Federal users could share with low-priority, non-Federal users on a Federally-owned system, with provisions for public safety high priority applications. Other scenarios include a commercially-owned system, built to Federal or local public safety requirements, that could be used by public safety representatives, and shared with non-public safety, low-priority users. Issues regarding the types of users that would share a commercial-public safety network, and the scope of their flexibility in using the system, would need to be carefully defined by the public safety agency(ies) when specifying their network requirements.

The FLEWUG recommends the PSWN Program Management Office study the pro's and con's associated with these concepts, taking into account potential regulatory barriers. As part of this study, the FLEWUG proposes that the PSWN PMO examine operational and economic viability of various systems.

4.4 Technology Issues

4.4.1 Operational Considerations

The concept of narrowbanding is adequate to support voice operations. However, contiguous spectrum is needed where additional flexibility is required to incorporate and implement new access technologies.

4.4.2 Receiver Standards

Regarding the Commission's request for comment regarding receiver standards in section 68, as sharing among Federal, state and local agencies increases, it is imperative that receiver standards be consistently applied throughout the public safety community. The FLEWUG strongly recommends that the Commission establish technical standards for receivers consistent with NTIA and industry standards. In addition, the Commission should continue to specify technical standards for transmitters.

4.5 Spectrum Allocation

4.5.1 Overview of Spectrum Issues

In section 69 the FCC asks about ways to make more effective use of the spectrum allocated to public safety services, as well as the spectrum necessary to ensure that the current and future needs of the community are met in a timely and cost efficient manner. One way to counteract the past forces that have resulted in a highly fragmented PSRS spectrum is to allocate a number of blocks in existing public safety or adjacent spectrum, with the intent that the PSWN PMO establish proper interoperability, efficiency, and cost objectives for the use of that spectrum.

Section 71 asks for comments about the amounts of spectrum needed as well as the type.

The FLEWUG supports the PSWAC recommendations regarding the amount of spectrum required from today to the year 2010.[16]

Discussion has taken place in the PSWAC, and the FLEWUG, regarding the use of some of the spectrum available in VHF TV channels 7 through 10, ranging in frequency from 174 through 198 MHz. It has been suggested that use of available channels throughout the country may solve immediate spectrum deficiencies; however, the utilization of different channels in different geographic areas will present interoperability problems. The FLEWUG recommends that the lower portion of VHF TV Channel 7 be allocated for public safety use.

4.5.2 Spectrum Allocation Options

4.5.2.1 Reallocation of Federal Spectrum

The FCC inquires in section 72 about the potential reallocation of Federal spectrum, even though it did not specify the reallocation of spectrum to commercial use. The FLEWUG requests that no additional Federal spectrum be reallocated to the FCC for commercial use. As previously stated, "Federal government users indicated that future Federal requirements could be satisfied in the currently allocated bands providing that: (1) no more Federal allocations are lost through transfer to the FCC for commercial use."[17]

4.5.2.2 Use of Commercial Services

Section 72 asks about the potential impact of the increased use of commercial services.

As new commercial technologies are introduced, it should not be assumed that they are immediately suitable for the public safety environment in general. As outlined in the PSWAC,

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[16] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), p. 3.

[17] Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Section 4.4.9.

Technology Report, technologies offer trade-offs which should be mapped to the applications they are intended to serve.[18] Refer to Section 4.6.1.

4.5.2.3 User-Driven Spectrum Projections

The projections for spectrum demand the FLEWUG supports are based on knowledge gathered via the PSWAC process, and through our own experiences. The FLEWUG would like to reserve the privilege to re-address spectrum issues with appropriate planning and management bodies to keep them current on changing public safety requirements. The PSWN PMO should facilitate ongoing discussions to identify future user requirements.

4.5.2.4 Fragmentation Requires a New Approach

Section 73 of the NPRM refers to the subject of contiguous spectrum.

In order to address the interoperability challenges the public safety community faces, allocations need to be contiguous rather than fragmented. Contiguous bands help to simplify interoperability. Non-contiguous spectrum poses compatibility challenges, greater potential for interference, and results in higher levels of contention because users have fewer alternative options. Contiguous spectrum offers greater flexibility, simultaneous operations in common spectrum, and compatible access methods. Compatible access methods can allow public safety to realize the benefits of economies of scale resulting from mass production of like equipment.

Reallocation of Federal Spectrum

In response to the Commission's question in section 78 about the feasibility of reallocating Federal spectrum, the FLEWUG recommends that no additional federal spectrum be relinquished for other uses.

4.5.2.5 Potential Sources For Additional Spectrum

Section 78 asks numerous questions about the quantities and potential sources of needed spectrum for public safety.

The FLEWUG supports the PSWAC conclusions about the need for more spectrum.[19] The report states, "More spectrum is required.

- Immediately, 2.5 MHz of spectrum should be identified for interoperability from new or existing allocations.

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[18] "Public Safety Wireless Advisory Committee Final Report, Volume1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), pp. 34 - 44.

[19] "Public Safety Wireless Advisory Committee Final Report, Volume1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), p. 3.

- In the short term (within 5 years), approximately 25 MHz of new public safety allocations are needed. The present shortages can be addressed by making part of the spectrum presently used for television broadcast channels 60-69 available as soon as possible.

- Over the next 15 years, as much as an additional 70 MHz of spectrum will be required to satisfy the mobile communication needs of the public safety community."

The FLEWUG agrees with the PSWAC Steering Committee requests for additional spectrum outlined in Sections 2.2 - 2.2.2.8 of the Final Report.[20]

In particular, the FLEWUG would like to call special attention to our support for the PSWAC request to be granted immediate new sharing of the 174 - 216 MHz VHF TV band[21], access to portions of the unused spectrum in the 746 - 806 MHz band (UHF TV Channels 60 - 69), and their request to be granted immediate spectrum relief by permitting increased sharing on unused TV channels nationwide below 512 MHz[22].

In addition, the FLEWUG believes:

- Public safety should be granted immediate spectrum relief by permitting increased sharing of *all* channels below 512 MHz, including VHF TV.

- Domestic Public Land Mobile Services in the 152.000 - 152.255 MHz, the 152.495 - 152.855 MHz and the 157.755 - 158.155 MHz ranges should be reallocated for public safety use to meet requirements for voice services.[23]

- Public safety should be granted shared access to the 1710 - 1755 MHz band for wide band data and some video use until the year 2004, at which time the non-Federal Government use should be allocated to public safety.

- Portions of the 4635 - 4685 MHz band should be allocated to public safety for video and other wide-band services.

- Public safety should be granted portions of the 1990 - 2110 MHz band to support fixed services.

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[20] "Public Safety Wireless Advisory Committee Final Report, Volume1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), pp. 21, 22.
[21] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Section 4.4.16.
[22] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Sections 2.2.2.1, 2.2.2.2.
[23] "Notice of Proposed Rule Making: Docket 96-86", (Washington, DC: Federal Communications Commission, September 1996), Section 79

4.5.2.6 System Sharing

In section 79, where the FCC references system sharing, the FLEWUG supports increased sharing among Federal, state and local government agencies as referenced earlier in this document. In order to promote sharing, the FLEWUG emphasizes the need to change:

- Current licensing procedures
- Provisions for primary and secondary status
- The enforcement of tariffs

The FLEWUG believes that current procedures in these and other areas impede rather than encourage network sharing.

The PSWN PMO should work with policy planners to study the effectiveness of all current procedures with regard to their impact on network sharing and recommendations as appropriate.

Where section 79 goes on to ask the responders to comment on how technical advances may enhance the prospects of sharing, the FLEWUG cites GPS as an example.

One advanced technology of particular interest is the potential use of embedded GPS receivers in public safety radios that would permit automatic device switching between channels to help solve geographic sharing problems. As GPS information is received by a radio, the location can be matched to the appropriate public safety frequency for that locale. This would be useful in an instance where adjacent jurisdictions sharing TV channels 7 and 8 with broadcasters needed to switch back and forth between channels for interjurisdictional communications. One jurisdiction may only have Channel 8 available for public safety radio use because the broadcasters are using Channel 7, and the other may have to use Channel 7, because the broadcasters are using Channel 8. In that situation, if all radios had the ability to automatically switch back and forth between the two, public safety representatives would not have to worry about manual or over-the-air programming. Jurisdictional boundaries between those agencies carrying GPS-embedded equipment would disappear from an interoperability perspective.

The FLEWUG not only encourages technical advances that could foster increased sharing, but recommends that the PSWN PMO provide advanced technology testbed opportunities that promote increased sharing. The FLEWUG recognizes that costs are a major concern for agencies considering advanced technology products. Any new technology introduced will have to be proven cost effective before it is likely to be accepted by the public safety community on a wide-scale basis. Cost analyses will be conducted by the PSWN PMO.

4.5.2.7 Spectrum Efficient Systems

There is little question that public safety agencies are interested in taking advantage of newer technologies that result in increased spectrum efficiencies. However, the desire for spectrum efficiency must be balanced by the continuing need to meet vital mission requirements in terms of effective and responsive communications for protection of life and property. The inability of

the general public to complete traditional telephone calls on holidays cannot be equated with the inability of a police officer to call for help during an armed robbery.

The concept of narrowbanding is seen by the FLEWUG as adequate to carry voice traffic during normal operations. However, we see a strong need in the narrowband environment to have grouped channels in order to better handle peak loads of traffic during emergency situations, and would encourage policy makers to consider this issue. In addition, although a narrowband channel is effective for voice traffic, it will be less useful for the passage of video and file transfers. The use of narrowband channels will result in unacceptable time delays for real-time public safety video or file transfer applications.

Spectrum allocations specifically designated for narrowband use unduly restricts public safety users. This restriction denies public safety users the flexibility to take advantage of the spectrum efficient, emerging digital technologies that the market is just beginning to explore. The FLEWUG recommends that public safety agencies be permitted the same flexibility as that recently afforded commercial radio services to determine, within their allocated spectrum, spectrally efficient technologies.

4.5.2.8 Options for Efficient Spectrum Use

The FLEWUG believes section 81 of the NPRM confuses the concept of "accessing reserve spectrum" with the concept of "having excess spectrum capacity". Public safety agencies must have access to reserve spectrum at a moment's notice during a major event or disaster. Spectrum is an essential tool for public safety workers. Its value to the public safety mission cannot be related to simple efficiency measures. For example, law enforcement officers do not "give up" their weapons because they use them infrequently. The effectiveness of public safety spectrum is in its availability, not its efficiency.

4.5.2.9 Federal/Non-Federal Sharing

In response to a request for comments in section 82, the FLEWUG supports the concept of shared Federal and non-Federal systems. To date, shared systems have met with mixed success. The PSWN PMO should evaluate why some shared systems work better than others. These studies could serve to better inform the public safety agencies considering shared systems.

4.5.2.10 Multi-Site Trunked Systems

In reference to section 83, the FLEWUG supports the NTIA's recommendations regarding the implementation of multi-site trunked communications systems.

A problem multi-site trunked communication systems face today is the fact that there are multiple regulatory offices and agencies, resulting in fractional spectrum administration. If there were a central spectrum manager, state and local assets could be more effectively administered. The FLEWUG supports the concept that NTIA be assigned as the central spectrum manager for all Federal, state and local public safety agencies. Local public safety frequency coordination

procedures could remain intact, and the PSWN PMO can provide recommendations for procedural changes to the NTIA as the agencies' needs change.

4.5.2.11 Commercial Services

In response to the FCC's inquiry about the use of commercial services in section 86, the FLEWUG supports the PSWAC conclusions regarding the use of commercial services, as outlined in the Steering Committee Executive Summary of their Final Report.[24]

4.6 Transition

Section 87 asks for numerous comments about transition strategies.

The FLEWUG supports the PSWAC steering committee recommendations and observations regarding transitioning strategies as outlined on pages 3 and 4 of the "PSWAC Final Report: Volume I".

In addition, the FLEWUG believes that transition priorities should take into consideration an individual agency's transition costs based on its embedded infrastructure and equipment, and their need for a particular technology. The FLEWUG believes that the most immediate need for enhanced systems is in urban areas.

4.6.1 Increased Use of Commercial Services

The FLEWUG supports the use of commercial services as noted in the PSWAC report.[25]

In response to questions in section 90 about the types of public safety activities that could be performed using commercial systems, the PSWN PMO has undertaken studies to determine what applications are currently being supported by one or more commercial services in a satisfactory manner. Other experiences are being documented to determine what challenges agencies and commercial vendors face in working together. These studies serve as a basis for an outreach program to the commercial marketplace, helping them determine how they can best assist public safety agencies.

As the FLEWUG, through the PSWN PMO, has undertaken efforts to explore commercial options, we have recognized a distinction between providers and the services they offer. We have also recognized that some services are more appropriate for specific applications than others. The NPRM did not make distinctions between commercial offerings and their appropriate use for specific applications. The FLEWUG would encourage policy-making bodies to recognize types and levels of service needed, based on the application environment.

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[24] "Public Safety Wireless Advisory Committee Final Report, Volume 1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), Sections 2.3 - 2.6.

[25] "Public Safety Wireless Advisory Committee Final Report, Volume1", (Washington, DC: Public Safety Wireless Advisory Committee, September 1996), pp. 3, 4.

Cost comparisons between commercial services and in-house services will be conducted by the PSWN PMO, to assist both commercial vendors and agencies in determining break-even points based on requirements and levels of service. Results of those studies will made available to parties interested in considering the installation of new infrastructure, upgrades, replacement costs, etc.

4.6.2 Funding for Spectrum Migration

Section 92 asks for comments about funding options for migration to new spectrum and systems.

The FLEWUG believes that public safety agencies should not be required to relinquish spectrum without suitable alternatives, nor should they be forced out of any frequency band(s) they occupy. Options should be left open so that an agency desiring to migrate to a new band can fund the migration with proceeds from its existing spectrum. An escrow account funded by future frequency auctions could be set up to provide incentives for public safety agencies to move to shared systems. Payments from the escrow account would allow these agencies to pay for upgrades or equipment.

4.6.3 Improving Public Safety Spectrum Administration

The FLEWUG believes that the NTIA should administer all public safety allocations and assignments at the federal, state and local levels, and to handle all administrative and regulatory issues associated with public safety frequency management.

4.7 Competition In The Supply Of Goods And Services

4.7.1 Regulatory Environment Fostering Competition

Where the FCC specifically asks in section 97 for comment on the tentative conclusion that any rules adopted in this proceeding should be technology-neutral, the FLEWUG supports the tentative conclusion. However, we recognize the need for technological consistency to enhance interoperability.

4.7.2 Project 25

Section 100 asks for comments about concerns regarding Project 25.

Consistent with our technology-neutral position, the FLEWUG feels that issues regarding Project 25, and issues raised by Ericsson, should not have appeared in this NPRM.

However, the FLEWUG does support Project 25 as a potential solution for interoperability for narrowband digital radio systems, operating in the same band, using frequency division multiple

access technology . Furthermore, the FLEWUG does not agree with the positions taken in the documents referenced by the NPRM.[26]

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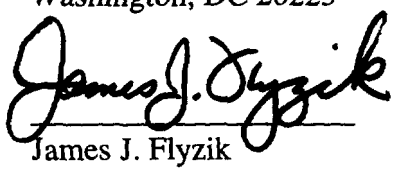

James J. Flyzik
Chairperson Government Information Technology Services Board

[26] "Notice of Proposed Rulemaking: Docket 96-86" (Washington, DC: Federal Communications Commission, April 10, 1996), p.35, footnote 51.